

we may notice one of the means employed for opening the minds of the young: we mean the introduction of botany into the parish school. The study was optional, but was ultimately pursued by a considerable number of the elder children with very great success: they took an eager delight in their botanical lessons; and one of the Inspectors of Schools states, "that the botanical lessons did draw largely upon the intelligent powers of his little pupils' minds there can be no question; and that these children, who out of school were much more conversable than the generality of children in rural parishes, owed a considerable share of the general development of their minds to the botanical lessons and the self-exercise connected with them." "Neither," says another inspector, "had I any reason to think that the botanical lessons interfered with a due study of the usual subjects of a national school. Independently of the botany, the Hitcham school ranked *well* among the better class of rural schools in the district."

But we must stop. We have no intention to give an abstract of this book, but to show that it is well deserving of perusal. As such we strongly recommend it to all our readers.

## PROCEEDINGS OF LEARNED SOCIETIES.

### ZOOLOGICAL SOCIETY.

May 13, 1862.—John Gould, Esq., F.R.S., in the Chair.

#### NARRATIVE OF SEARCH AFTER BIRDS OF PARADISE.

By ALFRED R. WALLACE, F.Z.S.

Having visited most of the islands inhabited by the *Paradisææ*, in the hope of obtaining good specimens of those extraordinary birds, and some knowledge of their habits and distribution, I have thought that an outline of my several voyages, with the causes that have led to their only partial success, might not prove uninteresting.

At the close of the year 1856, being then at Macassar in the island of Celebes, I was introduced to the master of a prau trading to the Aru Islands, who assured me that two sorts of Birds of Paradise were abundant there, the large yellow and the small red kinds—the *Paradisææ apoda* and *regia* of naturalists.

He seemed to think there was no doubt but I could obtain them either by purchase from the natives or by shooting them myself. Thus encouraged, I agreed with him for a passage there and back (his stay being six months), and made all my preparations to start by the middle of December.

Our vessel was a Malay prau of about 100 tons burthen, but differing widely from anything to be seen in European waters. The deck sloped downwards towards the bows, the two rudders were hung by rattans and ropes on the quarters, the masts were triangles standing on the decks, and the huge mat sail, considerably longer than the vessel, with its yard of bamboos, rose upwards at a great angle, so as to make up for the lowness of the mast. In this strange vessel,

which, under very favourable circumstances, plunged along at nearly five miles an hour, and with a Buginese crew, all of whom seemed to have a voice in cases of difficulty or danger, we made the voyage of about a thousand miles in perfect safety and very agreeably; in fact, of all the sea voyages I have made, this was one of the pleasantest.

On reaching the Bugis trading settlement of Dobbo, I found that the small island on which it is situated does not contain any Paradise-Birds. Just as I was trying to arrange a trip to the larger island, a fleet of Magindano pirates made their appearance, committing great devastations, and putting the whole place in an uproar; and it was only after they had been some time gone that confidence began to be restored, and the natives could be persuaded to take the smallest voyage. This delayed me two months in Dobbo without seeing a Paradise-Bird.

When, however, I at length reached the main island and ascended a small stream to a native village, I soon obtained a specimen of the lovely *P. regia*, which, when first brought me, excited greater admiration and delight than I have experienced on any similar occasion. The larger species was still not to be seen; and the natives assured me that it would be some months before their plumage arrived at perfection, when they were accustomed to congregate together and could be more easily obtained. This proved to be correct; for it was about four months after my arrival at Dobbo that I obtained my first full-plumaged specimen of *P. apoda*. This was near the centre of the large island of Aru; and I there, with the assistance of the natives, procured the fine series which first arrived in England.

While at Dobbo I had frequent conversations with the Bugis traders and with the Rajah of Goram, who all assured me that in the northern parts of New Guinea I could travel with safety, and that at Mysol, Waigiou, Salwatty, and Dorey I could get all the different sorts of *Paradisææ*. Their accounts excited me so much that I could think of nothing else; and after another excursion in Celebes I made my way to Ternate, as the best head-quarters for the Moluccas and New Guinea. Finding a schooner about to sail on its annual trading voyage to the north coast of New Guinea, I agreed for a passage to Dorey, and to be called for on the return of the vessel after an interval of three or four months. We arrived there, after a tedious voyage, in April 1858, and I began my second search after the Birds of Paradise.

I went to Dorey in full confidence of success, and thought myself extremely fortunate in being able to visit that particular locality; for it was there that Lesson, in the French discovery-ship 'Coquille,' purchased from the natives skins of at least eight species, viz. *Paradisææ papuana*, *regia*, *magnifica*, *superba*, *sexsetacea*, *Astrapia nigra*, *Epimachus magnus*, and *Sericulus aureus*. Here was a prospect for me! The very anticipation of it made me thrill with expectation.

My disappointment therefore may be imagined when, shortly after my arrival, I found all these bright hopes fade away. In vain I inquired for the native bird-hunters; none were to be found there; and

the inhabitants assured me that not a single Bird of Paradise of any kind was ever prepared by the Dorey people, and that only the common yellow one (*P. papuana*) was found in the district. This turned out to be the case; for I could get nothing but *P. papuana* sparingly, a few females of *P. regia*, and one young male of *Seleucidés alba*, a species Lesson does not mention. Nevertheless Lesson did undoubtedly obtain all the birds he mentions at Dorey; but the natives are great traders in a petty way, and are constantly making voyages along the coast and to the neighbouring islands, where they purchase Birds of Paradise and sell them again to the Bugis praus, Molucca traders, and whale-ships which annually visit Dorey harbour. Lesson must have been there at a good time, when there happened to be an accumulation of birds; I at a bad one, for I could not buy a single rare bird all the time I was there. I also suffered much by the visit of a Dutch surveying-steamer, which, for want of coals, lay in Dorey harbour a month; and during that time I got nothing from the natives, every specimen being taken on board the steamer, where the commonest birds and insects were bought at high prices. During this time two skins of *Astrapia nigra* were brought by a Bugis trader and sold to an amateur ornithologist on board; and I never had another chance of getting a skin of this rare and beautiful bird.

The Dorey people all agreed that Amberbaki, about 100 miles west, was the place for Birds of Paradise, and that almost all the different sorts were to be found there. Determined to make an effort to secure them, I sent my two best men with ten natives and a large stock of goods to stay there a fortnight, with instructions to shoot and buy all they could. They returned, however, with absolutely nothing. They could not buy any skins but those of the common *P. papuana*, and could not find any birds but a single specimen of *P. regia*. They were assured that the birds all came from two or three days' journey in the interior, over several ridges of mountains, and were never seen near the coast. The coast people never go there themselves, nor do the mountaineers who kill and preserve them ever come to the coast, but sell them to the inhabitants of intermediate villages, where the coast people go to buy them. These sell them to the Dorey people or any other native traders; so that the specimens Lesson purchased had already passed through three or four hands.

These disappointments, with a scarcity of food sometimes approaching starvation, and almost constant sickness both of myself and men, one of whom died of dysentery, made me heartily glad when the schooner returned and took me away from Dorey. I had gone there with the most brilliant hopes, which I think were fully justified by the facts known before my visit; and yet, as far as my special object (the Birds of Paradise) was concerned, I had accomplished next to nothing.

My ardour for New Guinea voyages being now somewhat abated, for the next year and a half I occupied myself in the Moluccas; but in January 1860, being joined (when at Amboyna) by my assistant Mr. Allen, I arranged a plan for the further exploration of the country of the *Paradisææ*, by sending Mr. Allen to Mysol, while I

myself, after making the circuit of the island of Ceram, was to visit him with stores and provisions and proceed to Waigiou, both returning independently to meet at Ternate in the autumn.

I had been assured by the Goram and Bugis traders that Mysol was the very best country for the Birds of Paradise, and that they were finer and more abundant there than anywhere else. For Waigiou I had, besides the authority of the native traders, that of Lesson also, who visited the north coast for a few days, and mentions seven species of Paradise-Birds purchased there by him.

These two promising expeditions turned out unfortunately in every respect. On reaching Goram, after much difficulty and delay, I found it impossible to make the voyage I had projected without a vessel of my own. I therefore purchased a small native prau of about 8 tons, and after spending a month in strengthening and fitting it up, and having with great difficulty secured a native crew, paid them half their wages in advance, and overcome all the difficulties and objections which every one of them made to starting when all was ready, we at length got away, and I congratulated myself on my favourable prospects. Touching at Ceramlaut, the rendezvous of the New Guinea traders, I invested all my spare cash in goods for barter with the natives, and then proceeded towards Mysol.

The very next day, however, being obliged to anchor on the east coast of Ceram on account of bad weather, my crew all ran away during the night, leaving myself and my two Amboyna hunters to get on as we could. With great difficulty I procured other men to take us as far as Wahai, on the north coast of Ceram, opposite to Mysol, and there by a great chance succeeded in picking up a makeshift crew of four men willing to go with me to Mysol, Waigiou, and Ternate. I here found a letter from Mr. Allen, telling me he was much in want of rice and other necessaries, and was waiting my arrival to go to the north coast of Mysol, where alone the *Paradisæ* could be obtained.

On attempting to cross the strait, seventy miles wide, between Ceram and Mysol, a strong east wind blew us out of our course; so that we passed to the westward of that island without any possibility of getting back to it. Mr. Allen, finding it impossible to live without rice, had to return to Wahai, much against his will, and there was kept two months waiting a supply from Amboyna. When at length he was able to return to Mysol, he had only a fortnight at the best place on the north coast, when the last boat of the season left, and he was obliged to take his only chance of getting back to Ternate.

Through this unfortunate series of accidents he was only able to get a single specimen of *P. papuana*, which is finer there than in most other places, a few of the *Ciccinnurus regius*, and of *P. magnifica* only a native skin, though this beautiful little species is not rare in the island, and during a longer stay might easily have been obtained.

My own voyage was beset with misfortunes. After passing Mysol, I lost two of my scanty crew on a little desert island, our anchor breaking while they were on shore, and a powerful current carrying

us rapidly away. One of them was our pilot; and, without a chart or any knowledge of the coasts, we had to blunder our way short-handed among the rocks and reefs and innumerable islands which surround the rocky coasts of Waigiou. Our little vessel was five times on the rocks in the space of twenty-four hours, and a little more wind or sea would in several cases have caused our destruction. On at length reaching our resting-place on the south coast of Waigiou, I immediately sent a native boat after my lost sailors, which, however, returned in a week without them, owing to bad weather. Again they were induced to make the attempt, and this time returned with them in a very weak and emaciated condition, as they had lived a month on a mere sand-bank, about a mile in diameter, subsisting on shell-fish and the succulent shoots of a wild *Bromelia*.

I now devoted myself to an investigation of the natural history of Waigiou, having great expectations raised by Lesson's account, who says that he purchased the three true *Paradisææ*, as well as *P. magnifica* and *P. sexsetacea*, with *Epimachus magnus* and *Sericulus aureus*, in the island, and also mentions several rare *Psittaci* as probably found there. I soon ascertained, however, from the universal testimony of the inhabitants, afterwards confirmed by my own observation, that none of these species exist on the island, except *P. rubra*, which is the sole representative of the *Paradisæidæ* and *Epimachidæ*, and is strictly limited to this one spot.

With more than the usual amount of difficulties, privations, and hunger, I succeeded in obtaining a good series of this beautiful and extraordinary bird; and three months' assiduous collecting produced no other species at all worthy of attention. The parrots and pigeons were all of known species; and there was really nothing in the island to render it worth visiting by a naturalist, except the *P. rubra*, which can be obtained nowhere else.

Our two expeditions to two almost unknown Papuan islands have thus added but one species to the *Paradisææ* I had before obtained from Aru and Dorey. These voyages occupied us nearly a year; for we parted company in Amboyna in February, and met again at Ternate in November, and it was not till the following January that we were either of us able to start again on a fresh voyage.

At Waigiou I learned that the Birds of Paradise all came from three places on the north coast, between Salwatty and Dorey—Sorong, Maas, and Amberbaki. The latter I had tried unsuccessfully from Dorey; at Maas, the natives who procured the birds were said to live three days' journey in the interior, and to be cannibals; but at Sorong, which was near Salwatty, they were only about a day from the coast, and were less dangerous to visit. At Mysol, Mr. Allen had received somewhat similar information; and we therefore resolved he should make another attempt at Sorong, where we were assured all the sorts could be obtained. The whole of that country being under the jurisdiction of the Sultan of Tidore, I obtained, through the Dutch resident at Ternate, a Tidore lieutenant and two soldiers to accompany Mr. Allen as a protection, and to facilitate his operations in getting men and visiting the interior.

Notwithstanding these precautions, Mr. Allen met with difficulties in this voyage which we had not encountered before. To understand these, it is necessary to consider that the Birds of Paradise are an article of commerce, and are the monopoly of the chiefs of the coast villages, who obtain them at a low rate from the mountaineers, and sell them to the Bugis traders. A portion is also paid every year as tribute to the Sultan of Tidore. The natives are therefore very jealous of a stranger, especially a European, interfering in their trade, and above all of going into the interior to deal with the mountaineers themselves. They of course think he will raise the prices in the interior, and lessen the demand on the coast, greatly to their disadvantage; they also think their tribute will be raised if a European takes back a quantity of the rare sorts; and they have besides a vague and very natural dread of some ulterior object in a white man's coming at so much trouble and expense to their country only to get Birds of Paradise, of which they know he can buy plenty at Ternate, Macassar, or Singapore.

It thus happened that when Mr. Allen arrived at Sorong and explained his intentions of going to seek Birds of Paradise in the interior, innumerable objections were raised. He was told it was three or four days' journey over swamps and mountains; that the mountaineers were savages and cannibals, who would certainly kill him; and, lastly, that not a man in the village could be found who dare go with him. After some days spent in these discussions, as he still persisted in making the attempt, and showed them his authority from the Sultan of Tidore to go where he pleased and receive every assistance, they at length provided him with a boat to go the first part of the journey up a river; at the same time, however, they sent private orders to the interior villages to refuse to sell any provisions, so as to compel him to return. On arriving at the village where they were to leave the river and strike inland, the coast people returned, leaving Mr. Allen to get on as he could. Here he called on the Tidore lieutenant to assist him and procure men as guides and to carry his baggage to the villages of the mountaineers. This, however, was not so easily done; a quarrel took place, and the natives, refusing to obey the somewhat harsh orders of the lieutenant, got out their knives and spears to attack him and his soldiers, and Mr. Allen himself was obliged to interfere to protect those who had come to guard him. The respect due to a white man and the timely distribution of a few presents prevailed; and on showing the knives, hatchets, and beads he was willing to give to those who accompanied him, peace was restored, and the next day, travelling over a frightfully rugged country, they reached the villages of the mountaineers. Here Mr. Allen remained a month, without any interpreter through whom he could understand a word or communicate a want. However, by signs and presents and a pretty liberal barter he got on very well, some of them accompanying him every day in the forest to shoot, and receiving a small present when he was successful.

In the grand matter of the Paradise-Birds, however, little was done. Only one additional species was found, the *Seleucides alba*,

of which he had already obtained a specimen on the island of Salwatty on his way to Sorong; so that at this much-vaunted place in the mountains, and among the bird-catching natives, nothing fresh was obtained. The *P. magnifica*, they said, was found there, but was rare; the *Sericulus aureus* also rare; *Epimachus magnus*, *Astrapia nigra*, *Parotia sexsetacea*, and *Lophorina superba* not found there, but only much further in the interior, as well as the lovely little Lory, *Charmosyna papuana*. Moreover, neither at Sorong nor at Salwatty could he obtain a single native skin of the rarer species.

Thus ended my search after these beautiful birds. Five voyages to different parts of the district they inhabit, each occupying in its preparation and execution the larger part of a year, have produced me only five species out of the thirteen known to exist in New Guinea. The kinds obtained are those that inhabit the districts near the coasts of New Guinea and its islands, the remainder seeming to be strictly confined to the central mountain-ranges of the northern peninsula; and our researches at Dorey and Amberbaki, near one end of this peninsula, and at Salwatty and Sorong, near the other, enable me to decide with some certainty on the native country of these rare and lovely birds, good specimens of which have never yet been seen in Europe. It must be considered as somewhat extraordinary that during five years' residence and travel in Celebes, the Moluccas, and New Guinea I should never have been able to purchase skins of half the species which Lesson, forty years ago, obtained during a few weeks in the same countries. I believe that all, except the common species of commerce, are now much more difficult to obtain than they were even twenty years ago; and I impute it principally to their having been sought after by the Dutch officials through the Sultan of Tidore. The chiefs of the annual expeditions to collect tribute, have had orders to get all the rare sorts of Paradise-Birds; and as they pay little or nothing for them (it being sufficient to say they are for the Sultan), the head men of the coast villages would for the future refuse to purchase them from the mountaineers, and confine themselves instead to the commoner species, which are less sought after by amateurs, but are to them a profitable merchandise. The same causes frequently lead the inhabitants of uncivilized countries to conceal any minerals or other natural products with which they may become acquainted, from the fear of being obliged to pay increased tribute, or of bringing upon themselves a new and oppressive labour.

I have given this short sketch of my search after the Birds of Paradise, barely touching on the many difficulties and dangers I experienced, because I fear that the somewhat scanty results of my exertions may have led to the opinion that they failed for want of judgment or perseverance. I trust, however, that the mere enumeration of my voyages will show that patience and perseverance were not altogether wanting; but I must plead guilty to having been misled, first by Lesson and then by all the native traders, it never having occurred to me (and I think it would not have occurred to any one), that in scarcely a single instance would the birds be found to

inhabit the districts in which they are most frequently to be purchased. Yet such is the case; for neither at Dorey, nor at Salwatty, nor Waigiou, nor Mysol are any of the rarer species to be found alive. Not only this, but even at Sorong, where the Waigiou chiefs go every year and purchase all kinds of Birds of Paradise, it has turned out that most of the specimens are brought from the central mountain-ranges by the natives of those places, and reach the shore in places where it is not safe for trading praus to go, owing to the want of anchorage on an exposed rocky coast.

Nature seems to have taken every precaution that these, her choicest treasures, may not lose value by being too easily obtained. First we find an open, harbourless, inhospitable coast, exposed to the full swell of the Pacific Ocean; next, a rugged and mountainous country, covered with dense forests, offering in its swamps and precipices and serrated ridges an almost impassable barrier to the central regions; and lastly, a race of the most savage and ruthless character, in the very lowest stage of civilization. In such a country and among such a people are found these wonderful productions of nature. In those trackless wilds do they display that exquisite beauty and that marvellous development of plumage, calculated to excite admiration and astonishment among the most civilized and most intellectual races of man. A feather is itself a wonderful and a beautiful thing. A bird clothed with feathers is almost necessarily a beautiful creature. How much, then, must we wonder at and admire the modification of simple feathers into the rigid, polished, wavy ribbons which adorn *P. rubra*, the mass of airy plumes on *P. apoda*, the tufts and wires of *Seleucides alba*, or the golden buds borne upon airy stems that spring from the tail of *Cicinnurus regius*; while gems and polished metals can alone compare with the tints that adorn the breast of *Parotia sexsetacea* and *Astrapia nigra*, and the immensely developed shoulder-plumes of *Epimachus magnus*.

I will now point out the distribution of the species of Birds of Paradise, as far as I have been able to ascertain it. The Aru Islands contain *P. apoda* and *P. regia*; and we have no positive knowledge of *P. apoda* being found anywhere else. Mysol has *P. papuana*, *P. regia*, and *P. magnifica*; Waigiou *P. rubra* only. Salwatty, though so close to New Guinea, has no restricted *Paradisææ*, but possesses *P. regia*, *P. magnifica*, *Ep. albus*, and *Sericulus aureus*. The island of Jobie, and the Mysory Islands beyond it, certainly contain true *Paradisææ*; but what species beyond *P. papuana*, is unknown. The coast districts of the northern part of New Guinea contain *P. papuana* and *P. regia* pretty generally distributed, while *P. magnifica*, *P. alba*, and *Sericulus aureus* are scarce and local. Lastly, the central mountains of the northern peninsula are alone inhabited by *Lophorina superba*, *Parotia sexsetacea*, *Astrapia nigra*, *Epimachus magnus*, and *Craspedophora magnifica*; and here also probably exist the unique *Diphyllodes Wilsoni* and *Paradigalla carunculata*.

The most widely distributed of the *Paradisææ* is therefore the little *P. regia*, which is found in every island except Waigiou. Next, and probably most abundant in individuals, comes the *P. papuana*,



wanting only in Aru, Salwatty, and Waigiou. The next most widely spread species is *P. magnifica*, occurring in two islands (Salwatty and Mysol) as well as on the mainland. The other species are all found on the mainland only—with the exception of *P. apoda* (probably restricted to Aru), and *P. rubra*, which, being certainly confined to the small island of Waigiou, offers the most restricted range of the whole family.

It is interesting to remark that all the islands on which true *Paradisææ* are found are connected by banks of soundings to the mainland of New Guinea. The *hundred-fathom line* includes the islands of Aru, Mysol, Waigiou, and Jobie, which have probably been, at no distant geological period, connected with New Guinea; while Ké, Ceram, &c., are separated from it by deep sea, and on them no *Paradisææ* exist.

The island of Gilolo, on which the genus *Semioptera* occurs, extends towards Waigiou, and has the island of Guebe exactly between the two, suggesting the probability of a connexion there; but the depth of the intervening sea is unknown.

It may be considered as certain that every species of Paradise-Bird yet obtained from the natives has come from the north peninsula of New Guinea, that being the part most frequented by the Malay traders. The vast extent of country east of long. 136° is quite unknown; but there can be little doubt that it contains other and perhaps yet more wonderful forms of this beautiful group of birds. If we look round the whole circumference of the globe, we shall be unable to find a region at once so promising to the naturalist and so absolutely a "terra incognita" as this great tropical land; and it is to be hoped that our explorers and naturalists may soon be induced to direct their attention to this hitherto neglected country.

## MISCELLANEOUS.

*Remarks in reference to the Gracula pectoralis of Mr. Wallace.*

By G. R. GRAY.

MR. WALLACE has lately described an interesting bird under the appellation of *Gracula pectoralis*, which bird had been previously recorded by Lesson, under the name of *Sericulus anais*, from a specimen in M. Bourcier's collection. Lesson gives a correct description (*Revue de Zool.* 1839, p. 44) of the bird, so far as a mutilated New-Guinean skin would permit.

The late Prince C. L. Bonaparte, in 1850, refers to Lesson's species in his 'Conspectus Avium,' but in his very short notice of it he unfortunately uses the word *abdomine* when it ought to have been *pectore*, and thus this misapplication of a word has caused a difficulty in defining the bird. This mistake he also continued in the 'Comptes Rendus,' 1853, page 831, though he there gave a new and more lengthened description. At the same time he proposed it as the type of a new division, under the name of *Melanopyrrhus*.